Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services

STATEMENT OF BASIS

Rain CII Carbon LLC - Norco Coke Plant
Norco, St. Charles Parish, Louisiana
Agency Interest Number: 44866
Activity Number: PER20070001
Proposed Permit Numbers: 2520-00003-V1 & PSD-LA-582 (M-3)

I. APPLICANT

Company:
Rain CII Carbon LLC
2627 Chestnut Ridge Ste 200
Kingwood, Texas 77339

Facility:
Norco Coke Plant
801 Prospect Ave
Norco, St. Charles Parish, Louisiana
Approximate UTM coordinates are 750.98 kilometers East and 3321.63 kilometers North, Zone 15

II. FACILITY AND CURRENT PERMIT STATUS

The Norco Facility processes green petroleum coke, producing calcined coke, which is used in the manufacturing of anodes for the aluminum industry. Green petroleum coke is received from an adjacent oil refinery and placed in storage bins. Green coke may also be received by truck. The green coke is fed to a countercurrent natural gas rotary kiln, where residual moisture and volatile compounds are removed. The calcined coke is discharged from the kiln into a rotary cooler where it is quenched by water and treated with a chemical wetting agent for dust control. The calcined coke is transported by screw conveyor and bucket elevators to storage bins for loadout into railcars or trucks.

The kiln flue gases are routed through a settling chamber and into the pyroscrubber for destruction of volatile materials not removed in the rotary kiln and particulates. The pyroscrubber retention time is 14 seconds. This length of time enhances the destruction of particulate fines and volatile compounds.

Heat energy (225 MMBTU/hr) generated during the coke calcining process is recovered in the heat recovery boiler (HRB) to produce steam (1,350 psi). The flue gases from the heat recovery boiler are directed through a high temperature baghouse to control particulate matter (PM) and sulfur trioxide (SO_3) emissions and the formation of a visible plume. Steam production is enhanced by injecting coffee chaff directly into the pyroscrubber. The Norco Coke Plant currently combust 22 tons per day of coffee chaff in the pyroscrubber as supplemental fuel.

The steam generated in the HRB is distributed by pipeline to the adjacent Motiva/Shell Utility Complex. The calcined coke is shipped off site via railcar/truck to other CII facilities for distribution to commercial markets.

The Norco Coke Plant is a designated Part 70 source. Prevention of Significant Deterioration permit, PSD-LA-582-M-2, was issued on December 10, 2004 to the complex.

III. PROPOSED PROJECT/PERMIT INFORMATION

Application

A permit application and Emission Inventory Questionnaire were submitted by Rain CII Carbon LLC on May 10, 2007 requesting a Part 70 operating permit modification. An addendum to the modification application dated July 9, 2007 was also received. By letter dated July 16, 2008, Rain CII Carbon requested and received approval to have the modification act as the Title V renewal for the facility.

Project

Rain CII Carbon is proposing the following changes:

- An increase in the allowable coffee chaff combusted in the pyroscrubber. The facility is currently permitted to handle and combust 22 tons per day of coffee chaff (8,030 tons per year). CII is requesting to increase the amount to 50 tons per day; however, the total annual chaff from the supplier will not exceed 10,000 tons per year,

- Due to the proposed increased amount of chaff to be handled, the emission of particulate matter from Emission Point FUG1 – Coffee Chaff Handling System will increase by up to 0.45 tons per year,

- Emissions associated with Emissions Points EQT05 – Heat Recovery Boiler Stack and EQT06 – Pyroscrubber Stack are also affected by the increase in coffee chaff being combusted in the pyroscrubber. The heat recovery boiler stack (EQT05) is equipped with a nitrogen oxide (NO_x) continuous emissions monitoring system (CEMS). The formation of NO_x emissions are and will continue to be controlled through good combustion practices and other operational controls. Therefore, CII is not requesting an increase in permitted NO_x emissions,

- Emissions of carbon monoxide (CO) are expected to increase by up to 1.03 tons per year as a result of the increase in coffee chaff,

- As a result of two engineering studies, CII has updated the potential SO_2 emissions calculations for the heat recovery boiler stack (EQT5) and the pyroscrubber stack (EQT6). Therefore, CII has revised the SO_2 emissions cap contained in GRP4 N-CAP78 Pyroscrubber / HRB CAP,

- Removal of fan amperage limitation, monitoring, and recordkeeping requirements from the Cooler Scrubber Stack (EQT12). Instead of fan amperage, CII will monitor pressure drop daily across the Rotary Cooler Multiclone (EQT17) and water flow rate once every four hours across the cooler scrubber. The scrubber water flow rate will be maintained at greater than 30 gallons per minute, and

- Lastly, this permit will require the installation and utilization of a SO_2 CEMS on the stack from the Heat Recovery Boiler Stack (EQT 005).

The primary air emissions associated with the coke calcining process include NO_x, SO_2, PM, CO and nominal volatile organic compounds (VOC). The sources with emissions other than PM are the pyroscrubber stack ant the heat recovery boiler.

The majority of the flue gases from the coke calcining process will exit through either the pyroscrubber stack (when there is no heat recovery), or the heat recovery boiler stack (when steam is being produced).

CII has stated that there is no effective control technology for NO_x emissions in the coke calcining industry; therefore, the emission of NO_x at the coke plant is uncontrolled. Administrative controls, such as limiting the average green coke sulfur content are used to control SO_2 emissions. PM_{10} and VOC emissions from the coke calcining process are controlled by the pyroscrubber. When the energy recovery system is in service, the flue gases will be routed through the baghouse and then released to the atmosphere through the heat recovery boiler stack.

PM_{10} emissions from the cooler quench system are controlled by the multiclone and wet scrubber prior to exiting the cooler scrubber stack. Fugitive PM_{10} emissions are primarily associated with material handling activities, such as calcining coke loadout, and calcined coke storage tanks. The emissions are minimized by the application of a dust suppressing agent.

Proposed Permit

Permit 2520-00003-V1 will renew and modify the current Part 70 operating for the Norco Coke Plant. PSD-LA-582 (M-3) will modify the facility's current PSD permit.

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Permitted Air Emissions

Estimated emissions for the Norco Coke Plant in tons per year are as follows:

Pollutant	Before	After	Change
PM_{10}	181.91	182.36	+ 0.45
SO_2	3360.00	3886.64	+ 526.64
NO_X	395.00	395.00	-
CO	4.20	5.23	+ 1.03
VOC	0.85	0.85	-
SO_3	27.00	27.00	-

IV. REGULATORY ANALYSIS

The applicability of the appropriate regulations is straightforward and provided in the Specific Requirements section of the proposed permit. Similarly, the Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions and standards are also provided in the Specific Requirements section of the proposed permit.

Applicability and Exemptions of Selected Subject Items

ID No:	Requirement	Notes
UNF 01 Norco Coke Plant	Chemical Accident Prevention Provisions [40 CFR 68]	DOES NOT APPLY. Facility does not store or use any regulated materials in quantities greater than threshold values.
	Comprehensive Toxic Air Pollutant Emission Control Program [LAC 33:III.Chapter 51]	DOES NOT APPLY. This facility is classified as a minor source of hazardous/toxic air pollutants. As such, it is not subject to any MACT regulations.
EQT 12 N-2 Cooler Scrubber Stack	Control of Emissions of Smoke [LAC 33:III.1101.B]	DOES NOT APPLY. When the presence of uncombined water is the only reason for failure to meet the requirements of LAC 33:III.1101.B, it does not apply, as per LAC 33:III.1111.C

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ID No:	Requirement	Notes
EQT 07 N-9 Dedust Oil Tank	Standards of Performance for Storage of Vessels for Petroleum Liquid for which Construction, Reconstruction, or Modification Commenced After June 11, 1973, and Prior to May 19, 1978 [40 CFR 60 Subpart K]	DOES NOT APPLY. Tank has a storage capacity of less than 40,000 gallons and was constructed in 1970.
	Control of Emissions of Organic Compounds [LAC 33:III.2103]	DOES NOT APPLY. Material stored has a vapor pressure less than 1.5 psia.
EQT 08 N-9 Cooling Tower EQT 09 N-10 Cooling Tower	National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers [40 CFR 63 Subpart Q]	DOES NOT APPLY. Facility is not a major source of hazardous air pollutants and coolers do not operate with chromium based treatment chemicals.

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Prevention of Significant Deterioration/Nonattainment Review

CII is requesting that the Department approve the use of a new calculation methodology for predicting sulfur dioxide (SO_2) emissions. During the fall of 2005, CII conducted an engineering study to evaluate SO_2 emissions and to develop a new calculation for the prediction of SO_2 emissions. The results of the study were submitted to the Department for review. The use of the new calculation methodology (as given below) was approved for use in the Gramercy Coke Plant's Title V permit. CII believes that the new methodology better estimates SO_2 emissions from the facility and better predicts (or conservatively over-predicts) emissions from all grades of calcined coke produced from the facilities.

The Norco Coke Plant was issued a PSD Permit (PSD-LA-582) on June 8, 1994. That permit established that the Best Achievable Control Technology (BACT) for SO_2 was a green coke sulfur content of 2.25% or less. The PSD permit also determined that, based on screening dispersion modeling, predicted ground-level concentrations of SO_2 were below the preconstruction monitoring exemption level and ambient significance levels. Additionally, soils, vegetation, and visibility were determined not to be adversely impacted by the changes. Since the issuance of the original PSD permit, CII has not had any major modification with respect to SO_2 emissions.

Because the change in calculation methodology alters the assumptions of the previous BACT analysis, a review of BACT for SO_2 is required. Based on a "top down" BACT analysis, wet lime scrubbing was shown to be technically feasible option for SO_2 control in the original PSD permit, but the costs involved with the technology prohibited its use. According to CII, wet lime scrubbing with energy recovery technology would have an incremental cost effectiveness of $3,134 per ton of SO_2 removed. In addition, the technology would have an added cost of $41 per ton of calcined coke produced. Based on economic considerations, this technology was rejected as BACT. CII has also stated that wet lime scrubbing without energy recovery would have an incremental analysis cost effectiveness of $2,036 per ton of SO_2 removed, but the would have an added cost of $32 per ton of calcined coke produced. Based on economic considerations, this technology was also rejected as BACT.

The table below shows the BACT costs and updated costs based on the requested change in calculations methodology. Although the incremental cost effectiveness does decrease by approximately 15%, the additional cost per ton of production does not change. Therefore, CII believes that the original BACT analysis would not have changed based on the new calculation methodology.

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Control Option	Total Annual Cost ($1,000)	Removal Efficiency (%)	Pre-Control Emissions (TPY)	Post-Control Emissions (TPY)	Total Cost Effectiveness ($/ton)	Incremental Cost Effectiveness ($/inc. ton)	Additional Cost Per Ton of Production ($/ton)
Wet Lime Scrubbing With Turbine Generator							
Original	12,000	95	3,360	168	3,759	3,134	41
Updated			3,864*	193	3,269	2,723	
Wet Lime Scrubbing Without Turbine Generator							
Original	8,500	95	3,360	168	2663	2,036	32
Updated			3,864	193	2315	1,770	
(*) – Updated emissions are based solely on the change of calculation methodology and do not reflect the separate coffee chaff project.							

Based on the information presented above, CII believes that the approval of the change of calculation methodology and the resultant change in SO_2 emissions is warranted, and that if this calculation had been used in the original PSD permit, the results of the BACT analysis, air dispersion modeling, and additional impacts analysis would not have changed significantly.

The PSD permit has been modified to reflect the changes in the emission limits as a result of the new calculation methodology.

Streamlined Equipment Leak Monitoring Program

There is no streamlined equipment leak monitoring program at the facility.

MACT Requirements

This facility is a minor source of toxic air pollutants (TAP) and therefore MACT is not required.

Air Quality Analysis

Emissions associated with the proposed facility were reviewed by the Air Quality Assessment Division to ensure compliance with the NAAQS and AAS. LDEQ did not require the applicant to model emissions.

General Condition XVII Activities

The facility will comply with the applicable General Condition XVII Activities emissions as required by the operating permit rule. However, General Condition XVII Activities are not subject to testing, monitoring, reporting or recordkeeping requirements. For a list of approved General Condition XVII Activities, refer to the Section VIII – General Condition XVII Activities of the proposed permit.

Insignificant Activities

All Insignificant Activities are authorized under LAC 33:III.501.B.5. For a list of approved Insignificant Activities, refer to the Section IX – Insignificant Activities of the proposed permit.

V. PERMIT SHIELD

No permit shield was requested.

VI. PERIODIC MONITORING

CII shall monitor NOx emissions and visible emissions from the Heat Recovery Boiler (N-8), and monitor opacity from the Pyroscrubber Stack (N-7).

Pressure drop across the Rotary Cooler Multiclone (EQT17) shall be monitored daily to ensure compliance with the PM_{10} limitation.

Water flow rate across the wet scrubber shall be monitored once every four hours to ensure control of particulate emissions from the Cooler Scrubber Stack (EQT12).

NOx shall be monitored on a continuous basis, and visible emissions and opacity shall be monitored on a daily basis.

This permit will require the installation and utilization of a SO_2 CEMS on the stack from the Heat Recovery Boiler Stack (EQT 005). The pound per hour sulfur input rates will be used to determine compliance with the SO_2 emissions limits set forth in this permit before the CEMS is installed and when the exhaust stream is not routed through the stack which contains the CEMS.

VII. GLOSSARY

Carbon Monoxide (CO) – A colorless, odorless gas, which is an oxide of carbon.

Maximum Achievable Control Technology (MACT) – The maximum degree of reduction in emissions of each air pollutant subject to LAC 33:III.Chapter 51 (including a prohibition on such emissions, where achievable) that the administrative authority, upon review of submitted MACT compliance plans and other relevant information and taking into consideration the cost of achieving such emission reduction, as well as any non-air-quality health and environmental impacts and energy requirements, determines is achievable through application of measures, processes, methods, systems, or techniques.

Hydrogen Sulfide (H_2S) – A colorless inflammable gas having the characteristic odor of rotten eggs, and found in many mineral springs. It is produced by the reaction of acids on metallic sulfides, and is an important chemical reagent.

New Source Review (NSR) – A preconstruction review and permitting program applicable to new or modified major stationary sources of air pollutants regulated under the Clean Air Act (CAA). NSR is required by Parts C ("Prevention of Significant Deterioration of Air Quality") and D ("Nonattainment New Source Review").

Nitrogen Oxides (NO_X) – Compounds whose molecules consist of nitrogen and oxygen.

Organic Compound – Any compound of carbon and another element. Examples: Methane (CH_4), Ethane (C_2H_6), Carbon Disulfide (CS_2)

Part 70 Operating Permit – Also referred to as a Title V permit, required for major sources as defined in 40 CFR 70 and LAC 33:III.507. Major sources include, but are not limited to, sources which have the potential to emit: $\geq$ 10 tons per year of any toxic air pollutant; $\geq$ 25 tons of total toxic air pollutants; and $\geq$ 100 tons per year of regulated pollutants (unless regulated solely under 112(r) of the Clean Air Act) (25 tons per year for sources in non-attainment parishes).

PM_{10} – Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by the method in Title 40, Code of Federal Regulations, Part 50, Appendix J.

Potential to Emit (PTE) – The maximum capacity of a stationary source to emit any air pollutant under its physical and operational design.

Prevention of Significant Deterioration (PSD) – A New Source Review permitting program for major sources in geographic areas that meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. PSD requirements are designed to ensure that the air quality in attainment areas will not degrade.

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Sulfur Dioxide (SO_2) – An oxide of sulfur.

Sulfuric Acid (H_2SO_4) – A highly corrosive, dense oily liquid. It is a regulated toxic air pollutant under LAC 33:III.Chapter 51.

Title V Permit – See Part 70 Operating Permit.

Volatile Organic Compound (VOC) – Any organic compound, which participates in atmospheric photochemical reactions; that is, any organic compound other than those, which the administrator of the U.S. Environmental Protection Agency designates as having negligible photochemical reactivity.